



**SELC Ireland Limited**  
IDEA • INNOVATION • REALISATION



## SELC Candelon

The Street Light Control & Management Solution.



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**The SELC Candelon Suite** is an open & scalable platform to control and manage your city street lights efficiently. The SELC candelon Suite operates on top of the SELC Candelon Intelligent Powerline Ballasts which are communicating 2-ways via i.Lon® 100 network controllers. The SELC Candelon solution also includes the Selc Lamp Node and Filter as you see in the above picture.

SELC Candelon Suite is a unique solution that enables electricity savings, maintenance costs reduction and enhanced quality of service for the citizen's security and satisfaction.

### SELC Candelon is composed of:

#### SELC Candelon Studio

The software solution to design web & scada type graphical animated city maps from which all your street lights can be tested, checked, controlled in real-time but also switched on/off and scheduled. The SELC Candelon Studio is powerful & open: you can select your personalised graphics, lamps animation, information to be displayed, alarms & trends. It provides you with productivity tools to easily create and deploy a very large installation (>100,000 lights). With SELC Candelon Studio's 'Web Publish Wizard', your graphical city maps are stored as embedded Web HMIs onto the local network controllers (i.e. i.LON®100) and/or on your central web server to be available at anytime from anywhere!

### Key Features

- Remote Public Lighting Test, Control and Command on graphical interactive city or facility maps
- Scheduling of preventative or corrective maintenance derived from recorded data indicating failures, preset tolerance breaches and trends
- Live and historical electricity consumption analysis
- Scheduled automatic light intensity profile adjustment to match traffic patterns
- Individual or group lamp control
- Open software framework easily personalised to end user's specific requirement
- Data stored in customer's choice of database. (MySQL, Oracle etc) Can be exported to Excel or other existing ODBC compatible systems
- Real time connection
- Web reports

### Applications

- Public and Street lighting
- High Bay Lighting
- Industrial and Commercial Lighting
- Security Lighting

### The SELC Candelon Suite offers...

1. Electricity savings
2. Reduction in maintenance costs
3. Quality of Service for citizen's security and satisfaction
4. Data gathering
5. Graphical Control and Command



## SELC Candelon Data Aggregator

Create historical detailed data and information from street lights and store/aggregate them into the centralized database of your choice (MySQL, Oracle, SQLSrv, MSAccess). Its objective is to build a central historical view of each street light's behaviour with no impact on the network. It serves the SELC Candelon web report software. Thanks to its open architecture, SELC candelon data aggregator may provide data to any other corporate application & service such as work order management tools, billing systems & call centres.

This provides you with "Business Reports" to help you take decisions on maintenance, operations & electricity consumption. It provides ready-to-use reports. As an example, the daily failure report & the forecast failure report pinpoint the street lights which have failed or which may not have normal behaviour. The remote operator can then use the Web City Maps created with SELC Candelon Studio, to target and test on these street lights without any on-site operation.

### Smart Ballast

The SELC 2000 range of electronic Smart Ballast is a revolutionary and innovative power source for High Pressure Sodium and Metal Halide (including CDM) lamps. It operates comfortably over a wide mains input voltage range (180V – 260V RMS 50/60Hz). Power Factor close to unity (>0.99) is maintained through out the lamps life. A low frequency power waveform is supplied to the lamp and this eliminates lamp resonance. Lamp cycling as experienced with conventional magnetic ballasts especially towards the end of the lamps life is no longer an issue. The control of those past problems ensures that an optimum lamp output is maintained to the end of the lamp's life. Extra benefits include higher power efficiency, the ability to control the dimming of lamps by up to 50% of lamp output power. The additional benefit of it been supplied with its own very accurate ambient light detector, eliminating the need for a nema socket, photocell and wiring.

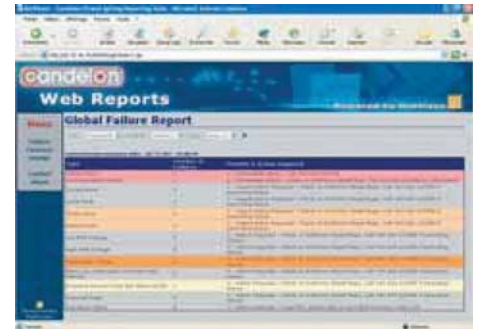
### Combi Node & Filter Incorporated

The Node is the interface between the SELC 2000 and the signal media. (Power line, RF, IR etc.) Data is sent to and from the ballast via the node.

The patented filter technique is the part of the system that ensures a clean data stream is provided on the system. It virtually eliminates data read errors caused by noise. It helps ensure that each and every byte of command and feedback data is transmitted and received cleanly.

### The i.LON 100

The i.LON 100 Internet Server is a high performance network interface that connects LonWorks networks to corporate IP networks or the Internet. The i.LON 100 features a built-in web server that allows web access to built-in scheduling, alarming, and data logging applications. Additionally, it exposes a SOAP/XML Web Services interface for integration with Dotvision applications. The i.LON 100 operates on 100 to 240 VAC and may be ordered with an optional built-in 56k V.90 analog modem.

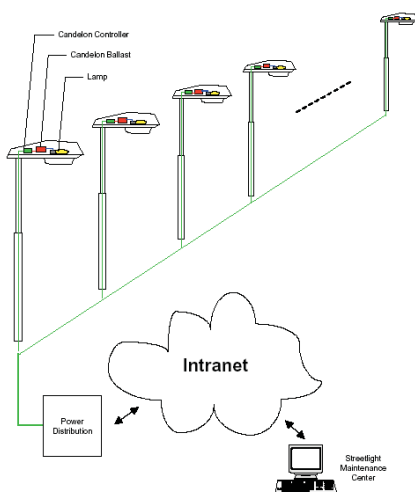


## Key Features

With the i.LON 100 you can access devices from a local network, a virtual private network, or the Internet – and user authentication makes sure only authorized users can access your network. Connectivity is via dial-up, dedicated ADSL or GSM/GPRS modem (additional - Siemens/Nokia modems are supported).

- ModBus interface for legacy devices
- Astronomical clock for lighting applications
- Enhanced scheduler for local control based on date, day, and time of day
- Supports the LonScanner Protocol Analyzer to ensure fast, successful LonWorks network deployment
- Web binding allows simplified interconnection between devices and applications using SOAP/XML
- Alarm monitoring and notification
- Data logging for monitoring system operation
- Bridges LonWorks domains for network expansion
- Remote network interface provides seamless support for the LonMaker Integration Tool and other tools based on LNS or OpenLDV
- Optional 56K V90 analog modem for dial-up support

## SELC Candelon Architecture



## The SELC Candelon Suite offers...

### 1. Data gathering

The SELC Candelon electronic ballasts communicate important maintenance information to the streetlight maintenance unit:

- Lamp status (OK, weak, faulty)
- Burning Hours
- Lamp Voltage
- Lamp Dim Level
- Lamp Power
- Ballast Temperature
- Energy Consumed

### 2. Remote Access

Accessible from anywhere at anytime via a web browser it enables the City's Operation Team or their Facility Managers to:

- Remotely verify & qualify failures to optimise Work Orders and Maintenance Operations.
- Provide relevant real-time information to identify failure cause and make the right decision.
- Identify group of failures and behaviours by geo zones.
- Check Work Order completion with online real-time tests and/or IP Cameras.
- Organise more efficient onsite check-up campaigns with in-car PC connection to local (i.LON®100) or central Web Servers providing with real-time status & street light information.

### 3. Open software framework

The architecture of underlying Supervisory Software Framework(provided by DotVision Software) is open to be easily enriched by new features and to exchange data with Corporate or Enterprise Applications such as existing Work Order Mgmt systems, Billing & Call Centres.

As the DataLog Agregator is 100% based on a Java/XML framework, it can be enriched to communicate with external corporate applications.

### 4. Personalised Software

The SELC Candelon Web Report software module is a JSP based software that provides built-in or personalized management reports at your fingertips.

Connected to the data provided by the SELC Candelon DataLog Agregator, SELC Candelon Web reports mainly answers Business Questions such as:

- Can list the Street Light in Failure and qualify the failure to prepare the work orders of the day?
- Which lamps need to be replaced during the next months, due to their real (not planned) working hours?
- Any type of Street Light consuming more electricity than expected? By geo area?

With SELC Candelon Web reports, you can design your own report with the existing JSP templates to provide the best quality of Service at the lowest cost (maintenance & electricity)!

## System Overview

here are layers which make up the Candelon System

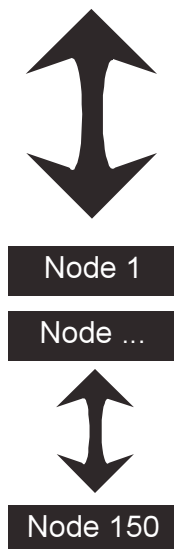
- 1) Lon Devices. (Nodes) – Communicates to the Ballast and iLon. (SELC)
- 2) iLON 100 – Visualisation Software
- 3) iLON 100 Connectivity

### Lon Devices Nodes

- The SELC nodes use existing power line networks as a means of communicating to the iLON100. Nodes do not communicate to each other – only to the iLON100 & ballast.
- Each node communicates to the iLON 100 using the Lonworks Power Line (PL) protocol. This is an open ANSI approved communications protocol – Open system.

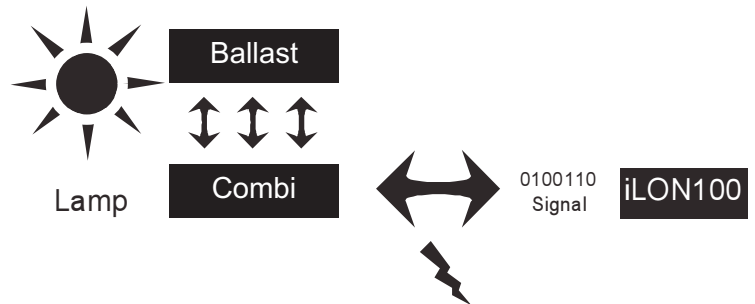


iLON 100 E4



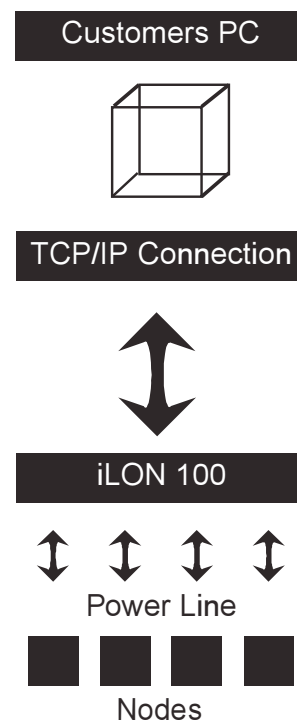
## Combi Node & Selc Smart Ballast

- Nodes are used to communicate to the ballast & iLON100.
- The means of comms to the ballast is via the 3 interface wires.
- The means of comms to the iLON100 is a TCP/IP connection.
- Filters are used to filter any electrical noise created by the ballast. If we don't use this filter noise "escapes" onto the power supply wiring.
- Those are the same wires we are going to use for communicating to the iLON100!!



## TCP/IP Connection

- 1) Dedicated ADSL
- 2) GPRS
- 3) Wi-Fi



*fit  
&  
forget*



**INTERNATIONAL SALES**

SELC Ireland Limited,  
Industrial Estate,  
Belmullet,  
Co. Mayo,  
Ireland

Phone: +353 (0)97 81209  
Fax: +353 (0)97 81400  
E-mail: [info@selc.ie](mailto:info@selc.ie)

**UK SALES**

SELC Electronics Ltd.,  
Vienna House,  
International Square,  
Birmingham International Park,  
Bickenhill Lane, Birmingham,  
B37 7GN

Phone: +44 (0)845 2013156  
Fax: +44 (0)845 2013157  
E-mail: [uksales@selc.ie](mailto:uksales@selc.ie)

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